Resources Evaluation Newsletter

• Classification • Remote Sensing • Inventory • Analysis •

U.S. DEPARTMENT OF THE INTERIOR
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REN 1 March 1980

WHAT'S THIS NEWSLETTER ALL ABOUT?

This is the start of a new newsletter being jointly sponsored by the USDA Forest Service's Resources Evaluation Techniques Program and the USDI Bureau of Land Management's Division of Resource Inventory Systems. This newsletter replaces and expands the BLM's Resource Inventory Notes. Resources Evaluation Newsletter (REN) is extended to cover classification systems, remote sensing, and data analysis as well as inventory techniques.

Basically we want this newsletter to serve as a focal point to exchange ideas on procedures for evaluating our natural resources. We want to know and want you to know what's going on in recreation, minerals, range, wildlife and fisheries, watershed, and forestry evaluation techniques.

Each issue of the newsletter will contain at least one or two lead articles; news about techniques development or use in the Forest Service, BLM, and any other agency or institution that sends us material; a current literature section; and a place for announcement of meetings, workshops, symposia, etc.

As with the Notes we will be depending heavily on contributed material for lead articles, news items, publications for the current literature section, and meeting notices.

Lead articles should be short and to the point, and typed double-spaced. Any submissions we receive are to be technically and grammatically correct. Therefore at least 2 outside technical reviews are recommended. Articles will be reviewed for general interest and utility only.

Material is also solicited for the current literature section. A short abstract (3 or 4 sentences) along with the address of where the publication can be obtained is desired.

If you have any workshops, meetings, or symposia relating to resources evaluation, send us the title, dates, the place, and a brief description of the meeting and the name and address of a person to contact for additional information. Be sure to allow a 3- or 4-month lag between the time you send us the announcement and the time it gets out to the reader.

The news section will be used to pass on general interest about work progress, ideas, tips, and for asking questions on resources evaluation problems.

Criticisms, ideas, and suggestions for improving the newsletter are always welcomed. Please send your material to:

Resources Evaluation Newsletter
USDA Forest Service, Rocky Mountain
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At present we will try to publish REN approximately 6 times a year depending on the amount of material received.

Those who are on the "Notes" mailing list will automatically receive the Resources Evaluation Newsletter. The list will be maintained by the Bureau of Land Management. If you want to get on (or off) the list, write to:

USDI Bureau of Land Management
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H. Gyde Lund, Editor (USFS)
Ronnie Clark, Associate Editor (BLM)

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IN-PLACE DATA

By
Doyle Turman[1/]

Just what is "in-place" data? Does it mean we know all of the details sufficient to describe a

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condition of interest existing at any time on any parcel of ground which could be selected? Or does it again mean that we will classify areas into geographical units about which we will know a combination or average of conditions existing at a particular time?

Before defining "in-place" data let us list some of its characteristics that have been expressed in terms of management needs.

1. We want to know where something is.
2. We want to know how much of something we have.
3. We want to analyze and/or infer what the effects are of taking some specific action on a certain area under certain conditions.
4. We want to find out the spatial arrangement, horizontally or vertically, of areas with similar characteristics.
5. We want the data structured so that interpretations can be tailored to need.

The above descriptors of "in-place" data really suggest that it is data tied to a ground location, and that for convenience sake these ground locations take on the form of areas with homogeneous characteristics. In simple terms, in-place data means that you know where it is located and what is there. If then we develop a set of "in-place" data for a specific interest or resource, it might consist of a delineated area on a plain view display (a map or photo) to which we affix a descriptive label or a full description. So we have drawn a boundary and have proceeded to describe the resource contained within.

So far so good; we can now construct a scheme for identifying and recording in-place data for a single resource. But when we define "in-place" data for a second resource we draw new boundaries around its homogeneous area, and label or describe them. Usually the areas delineated for two or more resources are not congruent. That is to say, even though the homogeneous units identified for two resources are similar they do not physically occupy the same space nor have common boundaries.

All of this may sound elementary, but it is this point at which "in-place" data schemes, as we have tried them in the past, begin to fall apart. As long as we have only one resource or interest to consider, "in-place" data is useful but when we try to combine all of the layers so we can get a handle on trade offs and assessments in multi-use planning and programing, it gets complicated. So what usually happens is a proposed design using one of the following three approaches:

1. Delineate areas homogeneous to both resources or interests. This will create a greater number of areas or units than either layer of the single interests contained.
2. Record average conditions of one resource or interest as it relates to the homogeneous area of the other resource.
3. Delineate geographic areas and describe the average condition of each interest or resource as it occurs within the area.

All three of these approaches are workable but, in use, certain faults or disadvantages show up. In the case of the first approach, stratification into areas homogeneous in character for all interests or resources will develop the maximum number of units or cells. Because of this complicated structure updating or changing is a serious problem. With biological resources, change is practically the name-of-the-game, and using this approach a change or reinterpretation in the boundary of any one condition of interest usually triggers a change in all surrounding areas. Likewise a change in the labels or descriptions would be required.

The second approach, while probably satisfactory for the existing inventory of the primary resource, compromises the data for any others. This then creates a desire for separate stratifications by each resource and as a result may force the redundant description of all other interests within each breakdown. As an example, a similar description of soil that might be found in a timber stratification may also be incorporated in a range stratification for the same piece of ground. Sometimes, slightly different interpretations may be desired and must therefore be recognized as a characteristic of "in-place" data.

The third approach can easily produce a single layer or stratification, but data for all individual interests or resources are compromised or generalized. This is the kind of data that is very useful for broad or long range planning but its value may be considerably reduced for project planning and programing. Depending on where you start in the planning scheme, this is usually the type of data base conceived first. However, when the time for implementing the plan approaches, more specific "in-place" data is required. In the past, this situation has generated two unrelated sets of "in-place" data; one for planning and one for programing.

If we carefully design a set of data layers (for example, one for trees, one for soils, one for range vegetation, etc.) and use a computerized mapping system, those systems defined by the USFS as Resource Information Display Systems (RIDS), we can have our "cake and eat it too." Combinations or mixes of layers can be then assembled for the full range of needs from the very detailed to very broad interpretations.

Using the purest definition of layered "in-place" data you can easily see a multitude of individual layers. For convenience and efficiency we may actually construct and store a composite of data layers. An example might be a composite of state, county, and congressional boundaries. In order to automate this, the land areas delineated by the composite of the boundaries of the three interests (state, county, and congressional

district) could be used as an overlay to classify the three resource layers. This would eliminate redundant recording of state, county, and congressional district for each area outlined with the three resource layers. Data layers that are erodible or highly changeable should not be combined in order to avoid a massive update problem.

The stored composite then is useful in that it reduces the number of stored layers but it will be more difficult to separate out the individual interest or layer included. On the other hand a computer constructed composite will look the same but maintains the accessibility to each individual layer. Using our same example, a change in congressional districts would require a major update or reconstruction of a stored composite but only a change of lines in the congressional district layer and a computer reconstruction of a generated composite.

This all may seem like a fine point but it should be considered when identifying and describing layers. Many layers at first glance may appear to be "pure basic" data when in fact they are composites; take timber stands for instance, which are really determined by a combination of factors, species composition, age, size, condition, etc. An excellent example of a useful stored composite, where overlapping data would not exist, might be for buildings and improvements. Each entry would then be described as to what it was, how and why it was constructed. In this case then all fences could be stored whether they be range fences or fences constructed to protect plantation or administration sites.

In summary:

1. At the site level, the most effective and efficient in-place inventory of an existing resource is based on an individual look at that resource. This is especially true since each resource usually has different temporal characteristics and different rates of change.
2. These separate inventories should be thought of as layers and the interrelationship of the layers can be determined by overlaying one with another.
3. It is not absolutely essential that all layered data be computerized but from the size of the job we are thinking of computerized mapping and storage may be our only solution at least for the working composites.
4. For efficiency some data layers can be combined and stored as composites.
5. Other data layers, subject to frequent change, may be individually automated and converted via the computer into working composites.
6. For a specific land area the maximum detailed "in-place" data base concerning a given resource should be so constucted that it can be aggregated and interpreted to satisfy all needs for information about that resource: One set of data for both programing and planning with different intensities of interpretation and summation.
7. "In-place" data layers are established for a specific land area as needed and to the degree of refinement required.
8. An "in-place" resource data layer once established may require many years of data collection to complete or may require periodic massive updating or complete re-establishment.

As mentioned above, because of the variation of conditions between Forests and Regions there may not be a standard set of data layers. In the same sense, there may not be just a single defined "in-place" data layer for a given resource but rather an array of layers each differing in its degree of refinement. The questions are: first, is an "in-place" layer needed on this Forest for this resource and second, if so to what level of detail?

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BLM's R.I.S.

The Division of Resource Inventory Systems in the Bureau of Land Management's (BLM's) Denver Service Center is responsible for the continuing agency-wide development of resource inventory standards and techniques. Created in March 1979, as a separate staff, the seven-person group is comprised of specialists representing such disciplines as range science, soil science, hydrology, wildlife biology, land use planning, sociology, and statistics.

The staff's work centers on achieving two complementary objectives. First, inventory techniques within the various resource disciplines are being developed as an integrated system of cost effective inventories. Second, opportunities to coordinate inventory efforts through data needs are being systematically examined.

Present activities of the staff, designed to achieve these goals, include study of the use of remote sensing in soil and vegetative surveys, refinement of BLM's on-the-ground Soil Vegetation Inventory Method, examination of relationships between inventories, budgeting, scheduling, land use planning, and environmental impact assessment, and similar work. Cooperative relationships in data collection with other agencies are another major focus of the group's activities. Examples of these tasks include the planning of a multiple-agency soil loss workshop, and ongoing sharing of ideas and problems with agencies such as the Forest Service, Soil Conservation Service, and Fish and Wildlife Service.

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R.E.T.

The Resources Evaluation Techniques (RET) Program is charged "to maintain and improve capabilities for national inventories and analyses of renewable resources." Chartered in 1976, the Program was created to respond to parts of the Forest and Rangeland Renewable Resources Planning Act of

1974 which, among other requirements, directs the Secretary of Agriculture, "--to make and keep current a comprehensive survey and analysis of the present and prospective conditions of and requirements for the renewable resources of the forest and rangelands of the United States, its territories and possessions, and of the supplies of such renewable resources including a determination of the present and potential productivity of the land--." Nationwide in scope, the Program is also responding to some needs and requirements of the Soil and Water Resources Conservation Act, the Federal Land Policy and Management Act, and the National Forest Management Act.

The Program is interagency in scope. Currently, scientists from the Forest Service, Bureau of Land Management, Soil Conservation Service, and Fish and Wildlife Service are working together to solve common problems on resource inventories, classification, and analyses. Technical assistance is obtained from the Geological Survey, and Economics, Statistics, and Cooperatives Service. Richard S. Driscoll, Rocky Mountain Forest and Range Experiment Station, is the Program Manager.

The Program is organized into four Research Work Units and two Support Groups. The Research Work Units, Support Groups, and Leaders are:

1. National Land (Site) Classification - Daniel L. Merkel
2. National Resource Inventory Techniques - H. Gyde Lund
3. National Resource Analysis Techniques - Thomas W. Hoekstra
4. Remote Sensing for Resource Inventories and Land Management Planning - Robert C. Aldrich
5. Statistical Research and Support Group - Hans T. Schreuder
6. Computer Systems and Data Support Group - Glen E. Brink

Current goals for the next two years are to:

1. Complete and implement the National Land (Site) Classification System.
2. Complete the framework for multi-resource inventory and recommend prototype models for integrated range, timber, and wildlife and fish habitat inventory.
3. Complete an Information Needs Assessment on data needs and requirements for renewable resource inventories and assessments/appraisals, and develop techniques for integrated resource analyses.
4. Implement and improve remote sensing techniques for the inventory, and for monitoring change in renewable resources.

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CURRENT LITERATURE

Please order directly from sources given. In the case of journal articles, contact your local library for availability.

GENERAL

Frayer, W. E. (ed.). 1979. Forest Resource Inventories Vol. I & II, Workshop Proceedings. (Fort Collins, CO, July 23-26, 1979) Colorado State University. 1037p. Price $20. Order from Dept. of Wood Sciences, Colorado State Univ., Ft. Collins, CO 80523. Checks should be made payable to Colorado State University.

Lund, H. Gyde and Elise McNutt. 1979. Integrating Inventories - An Annotated Bibliography. USDI Bureau of Land Management Technical Report 333. 183p. Order from USDI Bureau of Land Management D-460, Building 50, Denver Federal Center, Denver, CO 80225.

Beers, Thomas. 1979. Random Numbers, Means, Regression and the Programmable Calculator. 143p. Price $9. T&C Enterprises, P.O. Box 2196, W. Lafayette, IN 47906.

A Key to the Genera of Mexican Grasses. MP-1422. Texas Agric. Exp. Station, Texas A&M University, College Station, TX 77843.

CLASSIFICATION

Moir, William H., and John A. Ludwig. A Classification of Spruce Fir and Mixed Conifer Habitat Types of Arizona and New Mexico. Res. Paper RM-207.

Layser, Earle F., and Gilbert H. Schubert. Preliminary Classification for the Coniferous Forest and Woodland Series of Arizona and New Mexico. Res. Paper RM-208. Order from Publications Distribution, USDA Forest Service, RMF&RES, 240 West Prospect Street, Ft. Collins, CO 80526.

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REMOTE SENSING

Sharp, James M. 1979. Demonstrating the value of Landsat Data: A Case for lowered expectations. Photogrammetric Engineering and Remote Sensing, 45 (AP 11): 1487-1493.

Johnson, Robert W. and Robert C. Harriss. 1980. Remote Sensing for Water Quality and Biological Measurements in Coastal Waters. Photogrammetric Engineering & Remote Sensing. 46 (1): 77-85.

Howland, William G. 1980. Multispectral Aerial Photography for Wetland Vegetation Mapping. Photogrammetric Engineering and Remote Sensing. 46(1): 87-99.

Acronyms A reference guide used by NASA's Technology Applications Branch and the Western Regional Applications Program. Available from NASA, Ames Research Center, Moffett Field, CA. 94035.

Landsat Data Users Notes. A newsletter of interest to the user community regarding Landsat products and related remote sensing developments. Subscriptions available free of charge from User Services Section, USGS, EROS Data Center, Sioux Falls, SD 57198.

Forest Cover Photo - Interpretation Key for the Cumberland Plateau Forest Habitat Region in Alabama. Dept. Series No. 10

Forest Cover Photo - Interpretation Key for the Warrior Basin Forest Habitat Region in Alabama. Dept. Series No. 11. Order from Agricultural Exp. Station, Auburn University, Auburn, AL 36830.

Edminster, Carleton B., and James R. Getter. Aerial Stand Volume Table for Plains Cottonwood in Eastern Colorado. Res. Note RM-373. Publications Distribution, USDA Forest Service, RMF&RES, 240 West Prospect Street, Ft. Collins, CO 80526.

Avery, T. E. 1979. Foresters Guide to Aerial Photo Interpretation. Ag. Handbook No. 308. Publications Distribution, Room 025, Southeastern Forest Exp. Station, P.O. Box 2570, Asheville, NC 28802.

INVENTORY

Smith, G. E. J. 1979. Some Aspects of Line Transect Sampling When the Target Population Moves. Biometrics 35(1): 323-329.

Burnham, K. P. 1979. A Parametric Generalization of the Hayne Estimator for Line Transect Sampling. Biometrics 35(3): 587-595.

Cook, R. D. and J. O. Jacobson, 1979. A Design for Estimating Visibility Bias in Aerial Surveys. Biometrics 35(4): 735-742.

De Vries, P. G., 1979. A Generalization of the Hayne-type Estimator as an Application of Line Intersect Sampling. Biometrics 35(4): 743-748.

Diggle, P. J., 1979. On Parameter Estimation and Goodness-of-fit Testing for Spatial Point Patterns. Biometrics 35(1): 87-101.

Kempton, R. A., 1979. The Structure of Species Abundance and Measurement of Diversity. Biometrics 35(1): 307-321.

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Klein, Bennett and Young. A Pilot Survey to Measure Annual Mortality of Lodgepole Pine Caused by the Mountain Pine Beetle. Methods Application Group, Forest Insect & Disease Management, USDA Forest Service, 2810 Chiles Road, Davis, CA 95616.

Selected Reprints from the 1979 Workshop on Forest Resource Inventories. Estimating the Volume of Hardwood Crowns, Stems and the total tree. Res. Note SE-276.

Tyre and Siderelis. INSTANT - Count Sampling: A Technique for Estimating Recreational Use in Municipal Settings. Reprint. Order all from Publications Distribution, Room 025, Southeastern Forest Exp. Station, P.O. Box 2570, Asheville, NC 28802.

Forest Landscape Description and Inventories - A Basis for Land Planning and Design. Res. Paper PSW-49, USDA Forest Service, Pacific Southwest Forest and Range Exp. Station, P.O. Box 245, Berkeley, CA 94701.

Procedural Guide for Conducting Field Investigations on the Population Dynamics of the Southern Pine Beetle. MP-1427. Texas Agric. Exp. Station, Texas A&M University, College Station, TX 77843.

ANALYSIS

Tuinof, N. B. and G. M. Nichols. 1979. An Integrated Wildfire and Forest Management Information System. Forestry Chronicle 54(3): 152-155.

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life and Fish Data Base. In. Proc. Forty-Fourth North American Wildlife Conference. p. 380-391. Reprints available from Publications Distribution, USDA Forest Service, RMF&RES, 240 West Prospect Street, Ft. Collins, CO 80526.

1976 Inter-University Symposium on Renewable Resource Assessment and Programming: Executive Summary. Gen. Tech. Report PSW-21/1977. USDA Forest Service, Pacific Southwest Forest & Range Exp. Station, P.O. Box 245, Berkeley, CA 94701.

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MEETINGS, WORKSHOPS, SYMPOSIA

April 23-24, 1980. The Use of Multivariate Statistics in Studies of Wildlife Habitat. Contact: Multivariate Workshop, Wildlife Biology Program, University of Vermont, Burlington, VT 05405.

April 23-25, 1980. Continuing Education Course in Computer Modeling to Aid in Forest Measurement Decisions. University of Wisconsin, Stevens Point. $35. Contact: Extended Services, University of Wisconsin, Stevens Point, WI 54481.

April 23-30, 1980. 14th International Symposium on Remote Sensing of Environment. San Jose, Costa Rica. Contact: Dr. Jerald J. Cook, E.R.I.M., P.O. Box 8618, Ann Arbor, MI 48107.

April 24-25, 1980. Integrated Planning for Resource Use. Conservation Week Symposium. Contact: College of Natural Resources, Utah State University, Logan, UT 84322.

May 12-16, 1980. Advanced Topics in the Analysis of Remote Sensing Data. $595. Contact: Continuing Education Business Office, Room 110, Stewart Center, Purdue University, West Lafayette, IN 47907.

May 21-23, 1980. 6th Canadian Symposium on Remote Sensing. Halifax, Nova Scotia, Canada. Contact: Thomas T. Alföldi, Technical Program Chairman, c/o Canada Centre for Remote Sensing, 717 Belfast Road, Ottawa, Ontario, CANADA K1A 0Y7

July 13-25, 1980. 14th International Congress of the International Society for Photogrammetry. Hamburg, Fed. Republic of Germany. Contact: The Secretariate, ISP Congress 1980, c/o Hamburg Messe und Congress GmbH, Congress-Organization, Postfach 302 360, D-2000 Hamburg 36, Federal Republic of Germany.

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